Remarks

This amendment is in response to the Office Action dated June 4, 2003. Claims 1 and 9 have been amended and new claims 25-30 have been added. Claims 5, 7 and 14-23 were previously canceled without prejudice. Claims 1-4, 6, 8-13 and 24-30 are currently pending. Reexamination and reconsideration are respectfully requested.

Applicant thanks the Examiner for the personal interview conducted on April 22, 2003 and telephone conversations on 5/5 and 5/7, in which claims 1, 3 and 9 were discussed in connection with U.S. Patent No. 5,960,270 to Misra et al. ("Misra"). Issues raised in Applicant's previously filed Amendment were discussed and agreement was not reached for placing the case into condition for allowance during the interview.

Applicant has amended claims 1 and 9 to clarify aspects of embodiments of the present invention.

Claims 1-4, 6, 9-13 and 24 were rejected under 35 U.S.C. 103(a) as unpatentable over U.S. Patent No. 5,960,270 to Misra et al. (hereinafter "Misra"). The rejection is respectfully traversed.

To establish a prima facie case of obviousness, the following criteria should be met. First, there should be a suggestion or motivation in the art to modify the reference or to combine reference teachings. Second, there should be a reasonable expectation of success. Third, the reference(s) must teach all the claim limitations. MPEP section 706.02(j). Applicant respectfully submits that the Examiner's citations to the art are insufficient to satisfy the three criteria above and accordingly, the rejection should be withdrawn.

Applicant respectfully submits that the Examiner has cited no portion of the art that describes or suggests "removing a part of the first conductive layer between the sidewall insulation layers in a manner that the gate dielectric layer is not exposed to thereby form a recessed section on the first conductive layer between the sidewall insulation layers" as recited in claim 1.

Applicant does not agree with the Examiner's characterizations of Misra. The Examiner cited Fig. 16 at pages 2-3 of the Office Action for "not exposing the gate oxide 125". However, the Examiner, on page 2 of the Office Action, cited layer 105 as a gate dielectric layer in Fig. 10.

Fig. 16 clearly shows gate 106 (which, as seen in Figs. 10-11, came from layer 105) being exposed. Layer 125, which was cited by the Examiner, is shown in Fig. 17, which also shows a subsequently deposited layer 128a. Applicant respectfully submits that Fig. 16 of Misra appears to indicate that the gate oxide layer is exposed when the polysilicon layer 108 is etched.

Applicant also notes that the Examiner referred to Misra reference number 108 as a "first conduction layer". (Misra at col. 10, line 3, appears to erroneously use reference number 110 to refer to layer 108) As seen in Misra Fig. 16, the entire layer 108 is removed. Accordingly, "removing a part of the first conductive layer between the sidewall insulation layers . . . to thereby form a recessed section on the first conductive layer" is not performed at least because the entire layer 108 is removed, as clearly seen in Misra Fig. 16.

The Examiner cited Figs. 19-22 in an effort to establish that Misra describes "partially filling the recessed section with a second conduction layer in the recessed section to form a gate electrode that includes at least the first conduction layer and the second conduction layer." Office Action at page 3. As noted by the Examiner, the steps in Figs. 10-16 of Misra are also used in the embodiment described in Figs. 19-22. The Examiner had previously referred to Misra reference number 108 as a "first conduction layer". As seen in Misra Fig. 16, the entire layer 108 is removed. Fig. 19 shows layer 129, which is a different layer from layer 108. The layer 108, which the Examiner referred to as the first conduction layer, appears to no longer exist when the layer 129 is formed. If the layer that the Examiner refers to as the first conduction layer no longer exists, then applicant does not understand how the Examiner can justify the rejection on the stated basis. Thus, applicant respectfully submits that the Examiner cited no portion of Misra that describes "partially filling the recessed section between the sidewall insulation layers with a second conductive layer to form a gate electrode that includes at least the first conductive layer and the second conductive layer" as recited in claim 1. Moreover, even if, for some reason, the Examiner considers that layer 129 as a first conductive layer, then the method Misra describes for the embodiment of Figs. 19-22 does not describe "removing a part of the first conductive layer between the sidewall insulation layers" as recited in claim 1, as amended.

The Examiner further stated on page 3 of the Office Action that Misra discloses "forming a second insulation layer at the recessed section on the second conduction layer, the second insulation layer being composed of a material different from that of the first insulation layer

(Misra fig. 14 # 120 of nitride the first insulating layer of oxide)." Applicant notes that earlier on page 2 of the Office Action, the Examiner appeared to refer to Fig. 14 and reference number 120 of Misra as the "first insulation layer covering the first conductive layer and the side wall spacers." Thus, applicant does not understand the Examiner's use of the same reference number for both the first and the second insulating layers. Accordingly, applicant respectfully submits that the Examiner has cited no portion of Misra that describes "forming a second insulation layer that fills the recessed section on the second conductive layer, the second insulation layer comprising a material different from that of the first insulation layer" as recited in claim 1.

The Examiner also cited Misra Fig. 17, col. 18, lines 17-23 as describing "etching the first insulation layer to form a first through hole that reaches the source region of the drain region" and "forming a first contact layer in the first through hole". Applicant respectfully submits that Fig, 17 of Misra does not appear to indicate forming a first through hole or forming a first contact in the first through hole as suggested by the Examiner. Moreover, there does not appear to be a col. 18 in Misra.

The rejection of dependent claims 2-4 and 6 should be withdrawn for at least the same reasons as claim 1. Moreover, as it is unclear which layers the Examiner is referring to as a first and second insulation layers, the Examiner specific rejections of dependent claims 2, 4 and 6 are also unclear and should be withdrawn for this reason in addition to the reasons stated above for claim 1. In addition, for claim 3, the Examiner cited the presence of layer 108 and then cited Misra col. 10, lines 42-45 and 57-60 for "the steps of depositing a metal layer for siliciding the first conduction layer, on the first conduction layer" and for "siliciding the first conduction layer to form a silicide layer." However, applicant notes that Misra col. 10, lines 42-45 and 57-60, appears to refer to the embodiment illustrated in Figs. 19-22. As stated earlier, the layer 108 appears to have been completely removed prior to deposition of any additional layers shown in Figs. 19-22. As a result, there is no depositing a metal layer on the first conduction layer as suggested by the Examiner. In addition, as noted above, if, for some reason, the Examiner considers that layer 129 as a first conductive layer, then the method Misra describes for the embodiment of Figs. 19-22 does not describe "removing a part of the first conductive layer between the sidewall insulation layers" as recited in claim 1, as amended. Accordingly, for at least the above reasons, the rejection of claim 3 should be withdrawn.

Claim 9 and its dependent claims 10-13 and 24 can be distinguished for at least similar reasons as those discussed above for claim 1. In addition, applicant notes that the Examiner cited Misra Fig. 7 against claim 13. Misra Fig. 7 appears to show a method in which the entire layer 28b is removed. Thus, it appears that Fig. 7 does not describe or suggest a method in which "the removing a part of the first conductive layer further includes removing a greater depth of the first conductive layer from a center region than from end regions adjacent to the sidewall insulation layers" as recited in claim 13, because there is no first conductive layer remaining in the embodiment illustrated in Misra Fig. 7.

In the section of the Office Action entitled Response to Arguments, the Examiner provided a copy of Misra Fig 19 and stated that the Figure shows "removing a part of the first conduction layer in a manner so that the gate dielectric layer is not exposed to thereby form a recessed section on the first conduction layer between the insulating layers." Applicant notes that Misra Fig. 19 shows layer 129, which is a layer deposited to fill the feature size after a previous layer 108 has been removed. Misra at col. 10, lines 40-42. The Examiner refers to the previous layer 108 as a first conduction layer throughout the Office Action. As seen in Fig, 19, the layer 108 does not exist. Thus, there is no "recessed section on the first conduction layer" as the first conduction layer does not exist. Moreover, as noted earlier, even if the Examiner were to consider layer 129 as a first conduction layer, the layer 129 is not described in Misra as going through a step including "removing a part of the first conduction layer between the sidewall insulation layers . . . to thereby form a recessed section on the first conductive layer between the sidewall insulation layers " as recited in claim 1, as amended. Claim 9 can be distinguished in a similar manner.

The Examiner also provided a copy of Misra Fig. 21 and stated that Misra describes "filling a second conduction layer in the recessed section to form gate electrode that includes at least the first conductive layer and the second conductive layer." Applicant notes that as described above, the layer 108 that the Examiner previously referred to as the first conductive layer does not exist in Fig. 21. Moreover, as noted above, even if the Examiner were to consider the layer 129 as a first conductive layer, there is no "removing a part of the first conduction layer between the sidewall insulation layers . . ." as recited in claim 1, as amended.

Fig. 21 shows a structure that may be formed using a method described in Misra that is substantially different from that recited in the present claims. Applicant respectfully submits that the Office Action and the Examiner's Response to Arguments section do not supply a reasoned analysis of the elements of each of the claims and how Misra describes or suggests the combination of elements in the claims. Accordingly, applicant respectfully submits that the Examiner has not established a prima facie case of obviousness and the rejection of the claims should be withdrawn.

New claims 25-30 have been added. Support for the claims may be found throughout the specification, figures, and in the original claims. It is believed that no new matter has been entered. Examination is respectfully requested.

The Office Action also included various comments concerning the art and the non-patentability of features in various of the above mentioned claims. Applicant respectfully disagrees with the Examiner's non-patentability conclusions and characterizations of the art. The discussion above has directly addressed some of those comments and the Examiner's other comments are deemed moot at this time in view of this response.

Applicant respectfully submits that the pending claims are in patentable form. Reexamination and reconsideration are respectfully requested. If, for any reason, the application is not in condition for allowance, the Examiner is requested to telephone the undersigned to discuss the steps necessary to place the application into condition for allowance.

Respectfully submitted,

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Alan S. Raynes — **September 4 , 2003**
Alan S. Raynes — **(Date)**